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## CLAIMS IN AMENDMENT

[Received on May 13, 2004 (13.05.04) by the International Bureau; Claims 10, 11, 12, 13, 14, and 15 as filed were withdrawn.]

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9. A friction stir welding process according to claim 8, wherein said first end face (1) and said second end face (2) are present on the same metal workpiece, and said abutting regions are provided by curving said metal workpiece to bring said first end face (1) and said second end face (2) into abutment against each other.

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25 16. A friction stir welding apparatus (120) for bringing end faces (1, 2) of a plate material (W1), having fingers (7a through 7d) at corners thereof, into abutment

against each other to form a hollow cylindrical body (W2), and friction-stir-welding said end faces (1, 2) to each other, comprising:

5 a base (122);

first support means and second support means which are mounted on said base (122);

10 a support core (32) spaced from said base (122) by said first support means and said second support means, for insertion into said hollow cylindrical body (W2) and for supporting said hollow cylindrical body (W2); and

15 a first gripping member (238) and a second gripping member (268) disposed on said support core (32) for gripping respective protrusions (8, 9), which are formed when the fingers (7a through 7d) are held in abutment against opposite ends of abutting regions of said hollow cylindrical body (W2), and which extend along a joining direction;

20 wherein said support core (32) has passages (258, 260) defined therein for passage of a cooling medium therethrough.

25 17. A friction stir welding apparatus (120) according to claim 16, wherein said support core (32) comprises a first core member (252) having a curved portion for abutting against an inner circumferential wall surface of said hollow cylindrical body (W2) and a second core member (254) having a groove (256) with said first core member (252) inserted therein.

18. A friction stir welding apparatus (120) according to claim 17, wherein said passages (258, 260) are defined in said second core member (254).

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19. A friction stir welding apparatus (120) according to claim 17, wherein said support core (32) is spaced from said first support means and said second support means by being mounted on a support member (130).

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20. A friction stir welding apparatus (120) according to claim 17, further including cooling means (320) for cooling a rotating friction stir welding tool (100).

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21. A friction stir welding apparatus (120) for bringing end faces (1, 2) of a plate material (W1), having fingers (7a through 7d) at corners thereof, into abutment against each other to form a hollow cylindrical body (W2), and friction-stir-welding said end faces (1, 2) to each other, comprising:

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a base (122);

first support means and second support means which are mounted on said base (122);

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a support member (130) supported by said first support means and said second support means;

pressing means supported by said support member (130) and movable forward or backward by a displacing means (170),

for pressing said hollow cylindrical body (W2) from the side of an inner circumferential wall surface thereof;

5 a support core (32) supported by said support member (130), for insertion into said hollow cylindrical body (W2) and for supporting said hollow cylindrical body (W2); and

10 a first gripping member (238) and a second gripping member (268) disposed on said support core (32), for gripping respective protrusions (8, 9), which are formed when the fingers (7a through 7d) are held in abutment against opposite ends of abutting regions of said hollow cylindrical body (W2), and which extend along a joining direction.

15 22. A friction stir welding apparatus (120) according to claim 21, wherein said pressing means comprises:

a cam (174) movable forward or backward as said displacing means (170) moves forward or backward;

20 a plurality of rods (172) engaging said cam (174) and extending perpendicularly to the direction in which said cam (174) is movable forward or backward; and

pressers (186) mounted on respective distal ends of said rods (172), for pressing an inner circumferential wall surface of said hollow cylindrical body (W2).

25 23. A friction stir welding apparatus (120) according to claim 21, wherein said support core (32) has a discharge port (274) defined therein for discharging a compressed gas.

24. A friction stir welding apparatus (120) for bringing end faces (1, 2) of a plate material (W1), having fingers (7a through 7d) at corners thereof, into abutment against each other to form a hollow cylindrical body (W2), and friction-stir-welding said end faces (1, 2) to each other, comprising:

5 a base (122);

10 first support means and second support means which are mounted on said base (122);

15 a support core (32) spaced from said base (122) by said first support means and said second support means, for insertion into said hollow cylindrical body (W2) and for supporting said hollow cylindrical body (W2); and

20 a first gripping member (238) and a second gripping member (268) disposed on said support core (32) for gripping respective protrusions (8, 9), which are formed when the fingers (7a through 7d) are held in abutment against opposite ends of abutting regions of said hollow cylindrical body (W2), and which extend along a joining direction;

25 wherein either one of said first support means and said second support means is movable toward or away from said support core (32) by a displacing means (148).

25 25. A friction stir welding apparatus (120) according to claim 24, having a guide member (142) for guiding said first support means or said second support means while said

first support means or said second support means is displaced.

26. A friction stir welding apparatus (120) according to claim 24, wherein said first support means or said second support means comprises natural lock cylinders (126, 128), said natural lock cylinders (126, 128) having piston rods (158, 160) that are elevated to support said support core (32) after the natural lock cylinders (126, 128) are inactivated.

27. A friction stir welding apparatus (120) for bringing end faces (1, 2) of a plate material (W1), having fingers (7a through 7d) at corners thereof, into abutment against each other to form a hollow cylindrical body (W2), and friction-stir-welding said end faces (1, 2) to each other, comprising:

a base (122);

first support means and second support means which are mounted on said base (122);

a support core (32) spaced from said base (122) by said first support means and said second support means, for insertion into said hollow cylindrical body (W2) and for supporting said hollow cylindrical body (W2);

a first gripping member (238) and a second gripping member (268) disposed on said support core (32) for gripping respective protrusions (8, 9), which are formed when the

fingers (7a through 7d) are held in abutment against opposite ends of abutting regions of said hollow cylindrical body (W2), and which extend along a joining direction;

5 two aligning boards (286, 288) held in abutment against an end face of said hollow cylindrical body (W2) and disposed one on each side of abutting regions of said hollow cylindrical body (W2); and

10 aligning means having a cylinder (188) for pressing said hollow cylindrical body (W2) from the side of an opposite end face thereof, to displace the hollow cylindrical body (W2) until said one face of the hollow cylindrical body (W2) abuts against said aligning boards (286, 288).

15 28. A friction stir welding apparatus (120) according to claim 27, wherein either one of said first gripping member (238) and said second gripping member (268) is displaced by said cylinder (188).

20 29. A friction stir welding apparatus (120) according to claim 27, wherein said first gripping member (238) or said second gripping member (268) is displaced and fits over said protrusion (8, 9) of said hollow cylindrical body (W2) after displacement of the hollow cylindrical body (W2) has 25 finished.

30. A friction stir welding apparatus (120) for

bringing end faces (1, 2) of a plate material (W1), having fingers (7a through 7d) at corners thereof, into abutment against each other to form a hollow cylindrical body (W2), and friction-stir-welding said end faces (1, 2) to each other, comprising:

5 a base (122);

first support means and second support means which are mounted on said base (122);

10 a support member (130) supported by said first support means and said second support means;

a support core (32) disposed on said support member (130), for insertion into said hollow cylindrical body (W2) and for supporting said hollow cylindrical body (W2);

15 a first gripping member (238) and a second gripping member (268) disposed on said support core (32), for gripping respective protrusions (8, 9), which are formed when the fingers (7a through 7d) are held in abutment against opposite ends of abutting regions of said hollow cylindrical body (W2), and which extend along a joining direction;

20 first pressing means (352) supported by said support member (130), for pressing an inner circumferential wall surface of said hollow cylindrical body (W2) vertically downwardly with a resilient biasing means; and

25 second pressing means supported by said support member (130) and displaceable by displacing means (170) for pressing an inner circumferential wall surface of said

hollow cylindrical body (W2) horizontally.

31. A friction stir welding apparatus (120) according to claim 30, having presser stop means (290a, 290b) for pressing said hollow cylindrical body (W2) from the side of an outer circumferential wall surface thereof to a stop.